

ABSTRACT

A GPS receiver acquires carrier frequency and Gold code phase using short segments of a received GPS signal. In one embodiment, a 1-ms segment of the GPS signal is transformed to the frequency domain. This is multiplied by a frequency representation of the Gold code. The resulting product is converted to the time domain, and a peak is detected. The location of the peak corresponds to the code phase. If no peak is located, the carrier frequency is changed. Full- and half-bin steps in carrier frequency are considered. Processing gain is achieved by using longer segments of the input signal, for example 4 or 16 ms and integrating 1-ms segments. Considerations are provided for compensating for the effects of a transition, should it occur in the short segment of the GPS signal being processed. Integrations can be performed using non-coherent and coherent techniques.